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PROCEEDINGS
OF
THE ROYAL SOCIETY.

November 19, 1857.

Dr. W. A. MILLER, V.P., in the Chair.

In accordance with the Statutes, notice was given of the ensuing Anniversary Meeting for the election of Council and Officers.

Mr. Thomas Davidson, Mr. George Bowdler Buckton, and Mr. Joseph Whitworth, were admitted into the Society.

Mr. Gassiot, Mr. Hardwick, Mr. Horner, Dr. Percy, and Mr. Archibald Smith, were elected by ballot as Auditors of the Treasurer's Accounts, on the part of the Society.

The following communications were read:—

- I. "On the Anatomy of *Tridacna*." By J. D. MACDONALD, Esq.
(For Abstract, see vol. viii. p. 589.)
- II. "Summary of a paper on the Spinal Cord as a leader for Sensibility and Voluntary Movements." By E. BROWN-SÉQUARD, M.D.
(See vol. viii. p. 591.)
- III. "Summary of a paper on the resemblance between the effects of the section of the Sympathetic Nerve in the Neck and of a transverse section of a lateral half of the Spinal Cord." By E. BROWN-SÉQUARD, M.D.
(See vol. viii. p. 594.)
- IV. "Experimental Researches on the Influence of Efforts of Inspiration on the Movements of the Heart." By E. BROWN-SÉQUARD, M.D.
(See vol. viii. p. 596.)

- V. "Summary of a paper on the Influence of Oxygen on the vital properties of the Spinal Cord, Nerves, and Muscles."

(See vol. viii. p. 598.)

- VI. "Summary of a paper on the Power possessed by Motor and Sensitive Nerves of retaining their vital properties longer than Muscles, when deprived of Blood." By E. BROWN-SÉQUARD, M.D.

(See vol. viii. p. 600.)

- VII. "Ocular Spectres, Structures, and Functions, Mutual Exponents." By JAMES JAGO, A.B., M.B. &c.

(For Abstract, see vol. viii. p. 603.)

- VIII. "On Hourly Observations of the Magnetic Declination made by Capt. Maguire, R.N., and the Officers of H.M. Ship 'Plover,' in 1852, 1853 and 1854, at Point Barrow, on the Shores of the Polar Sea." By Major-General EDWARD SABINE, Treas. and V.P.R.S. &c.

(For Abstract, see vol. viii. p. 610.)

November 26, 1857.

Major-Gen. SABINE, R.A., Treasurer and V.P., in the Chair.

In accordance with the Statutes, notice was given of the ensuing Anniversary Meeting, and the list of Officers and Council proposed for election was read as follows:—

President—The Lord Wrottesley, M.A.

Treasurer—Major-General Sabine, R.A.

Secretaries— $\left\{ \begin{array}{l} \text{William Sharpey, M.D.} \\ \text{George Gabriel Stokes, Esq., M.A.} \end{array} \right.$

Foreign Secretary—William Hallows Miller, Esq., M.A.

Other Members of the Council.—James Moncrieff Arnott, Esq. ; George Busk, Esq. ; Arthur Farre, M.D. ; Edward Frankland, Ph.D. ; John Peter Gassiot, Esq. ; William Robert Grove, Esq., M.A. ; Philip Hardwick, R.A. ; Joseph Dalton Hooker, M.D. ; Leonard Horner, Esq. ; James P. Joule, Esq., LL.D. ; Richard Owen, Esq.,

LL.D.; John Percy, M.D.; Lyon Playfair, Ph.D.; The Rev. Bartholomew Price, M.A.; Archibald Smith, Esq., M.A.; Charles Wheatstone, Esq.

Mr. Henry Clifton Sorby was admitted into the Society.

The following communications were read:—

- I. "On the Expansion of Wood by Heat." By J. P. JOULE, LL.D., F.R.S. &c. Received November 5, 1857.

In pursuing the researches of which abstracts have been given in the 'Proceedings' for January 29 and June 18, the author found that the heat evolved by compressing wood, cut either in or across the direction of the grain, was nearly that due to the application to the particular case of Professor Thomson's formula. Exact agreement could not be expected, on account of the discordant results arrived at by different experimenters on the expansion of wood. On investigating the subject, the author finds that the expansion of wood cut in the direction of the grain, is greatly influenced by the tension to which it is exposed, as well as by its humidity. A rod of well-seasoned and dried bay-wood, $\frac{3}{8}$ ths of an inch in diameter, and exposed to the tension of 26 lbs., gave an expansion of $\cdot 00000461$ per degree Centigrade, but when a weight of 426 lbs. was hung to it, its coefficient of expansion was increased to $\cdot 00000566$. In conformity with this result, it was found that the elasticity of the rod was considerably diminished by an increase of its temperature. On investigating the effect of humidity, the author found that it occasioned a diminution in the expansibility by heat. After the rod of bay-wood with which the above experiments were made had been immersed in water until it had taken up 150 grains, making its total weight 882 grs., its expansion with a tension of 26 lbs. was found to be only $\cdot 000000436$. Experiments with a rod of deal 33 inches long, and weighing when dried 425 grs., gave similar results. Its expansion when dry, with 26 lbs. tension, was $\cdot 00000428$, and with 226 lbs. $\cdot 00000438$; but when made to absorb water, its coefficient of expansion gradually decreased, until, when it weighed 874 grs., indicating an absorption of 449 grs. of water, expansion by heat ceased altogether, and, on the contrary, a *contraction* by heat equal to $\cdot 000000636$ was experienced.